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HOANG, HIEU T				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/652,327

Applicant(s)

ELZUR ET AL.

Examiner

HIEU T. HOANG

Art Unit

2152

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/24/2008 has been entered.
2. Claims 29-31 are new.
3. Claims 1-31 are pending.

Response to Amendment

4. Previous claim objections and 35 U.S.C. 101 rejections have been withdrawn due to the amendment.

Response to Arguments

5. Applicant's arguments have been fully considered but they are not persuasive.
6. Applicant argues that the prior art does not teach "a plurality of different types of network traffic". The examiner respectfully disagrees. Applicant seems to argue that initial creation of a CCB through a host stack requires slow path processing for fast path candidate traffic, therefore fast path candidate traffic and slow path candidate traffic are the same traffic type. This argument is vague. Although Boucher requires initial creation of a CCB through a host stack for fast path candidate traffic, fast path candidate traffic

and non-fast path candidate traffic are identified and processed distinctly (fig. 3, step 59 checks for whether traffic is fast path candidate or slow path candidate by checking packet headers for protocol types—col. 7 lines 37-42, non-fast path packet traffics or protocols are directly sent to host stack for slow processing, but fast path candidate traffic or certain fast path protocols are processed differently by bypassing host stack and sending them to destination in host via fast path). The fact that Boucher distinguishes a fast path candidate traffic from a non-fast path traffic based on protocol header types allows one to conclude Boucher disclosed "different types of traffic".

Secondly, because there is no explicit explanation of how traffic types are different in the claims, two different protocols can be read as two traffic types (fast path candidate offload traffic such as TCP/IP and non-fast path candidate traffic such as Ethernet, IP traffics (fig. 9, MAC and network layer traffics), or even TCP/IP and SPX/IPX and TTCP/IP (col. 7 l. 37-42) and SMB (server message block) over TCP/IP (col.13 l. 43-58)). Third, independent claims (such as claim 3) define a traffic type as one of Ethernet traffic and offload traffic. Boucher discloses fast path candidate traffic (TCP/IP) as being offload traffic (identified by packet protocol header) and non-fast path traffic (Ethernet and IP) as cited above.

7. Argument on claim 3 based on "two or more of common Ethernet traffic, offload traffic" is unpersuasive for the same rationale above.

8. The applicant traversed the Official Notice taken to show "employ time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots" and "dynamically allocating fixed resources between among the different types of

network traffic". In response, the examiner submits that the Microsoft Computer Dictionary (fifth edition) defines TDM as a form of multiplexing in which transmission time is broken into segments, each of which carries one segment of one signal, reading on "time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots." "Dynamically allocating fixed resources between among the different types of network traffic", given its broadest interpretation, means dynamically allotting amount of resource(s) for each type of traffic, which is known to one skilled in the art how to implement (see Yang et al. US 2002/0041566, abstract).

9. Applicant argues on the motivation of combining the prior arts. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it is submitted that all necessary motivation for prior art combination has been provided in the previous Office Action and maintained.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 30 recites "coupling to an integrated chip to..." It is totally vague what is coupled to the integrated chip. Correction is required.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-4, 15-20, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Boucher et al. (US 6,226,680, hereafter Boucher).

14. For claim 1, Boucher discloses a server, comprising:

- a network connector (fig. 13, col. 16 lines 6-12, network line 210, four network lines are presented for different conduits, but each of them is a media independent interface);

- a processor coupled to the network connector (fig. 13, microprocessor 470, col. 16 line 62-col. 17 line 13), the processor being operable to process a plurality of different types of network traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path);
- a peripheral component interface (PCI) bridge coupled to the processor (fig. 13, PIC bus interface unit); and
- a unified driver coupled to the PCI bridge, the unified driver being operable to provide drivers associated with the plurality of different types of network traffic (fig. 6 and 10, PCI bridge 157 connected to protocol stack with driver, col. 14 l. 9-13, INIC miniport driver determines whether the traffic is fast path candidate offload traffic or non-fast path IP and/or Ethernet traffic).

15. For claim 2, Boucher further discloses the network connector comprises an Ethernet connector (fig. 13, network line 210 is an Ethernet connector).

16. For claim 3, Boucher further discloses the plurality of different types of network traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic, interprocess communication (IPC) traffic, management traffic and remote direct memory access (RDMA) traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path, or Ethernet traffic and offload traffic).

17. For claim 4, Boucher further discloses the processor comprises a single integrated chip (fig. 9, fig. 13, microprocessor).

18. For claim 15, Boucher further discloses the processor or the PCI bridge determines which of the different types of network traffic accesses a particular service provided by the server (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic).

19. For claim 16, the claim is rejected for the same rationale as in claim 13.

20. For claim 17, Boucher further discloses the processor, the PCI bridge or the unified driver provides a unified data and control path (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic).

21. For claim 18, Boucher discloses a method for network interfacing, comprising:
handling a plurality of different types of network traffic via a layer 2 (L2)
connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller supporting both offload traffic and regular IP traffic);

processing the different types of network traffic in a single chip (fig. 13, microprocessor 470, col. 16 line 62-col. 17 line 13, col. 3 lines 35-67, the INIC supports an offload traffic via fast path and regular IP traffic via a slow path); and

determining which of the different types of network traffic accesses software services via a single data path (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path candidate offload traffic or non-fast path IP or Ethernet traffic, single line connecting INIC and INIC miniport driver, fig. 13, a single PCI bus interface 257 to).

22. For claim 19, Boucher further discloses the plurality of different types of network traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic, interprocess communication (IPC) traffic and management traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path, or Ethernet traffic and offload traffic) and/or remote direct memory access (RDMA) traffic.

23. For claim 20, Boucher further discloses the L2 connector is a single L2 connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller, four network lines are presented for different conduits, but each of them is media independent interface).

24. For claim 23, Boucher further discloses: providing drivers associated with the plurality of different types of network traffic via a unified driver (fig. 11 INIC miniport driver for both offload traffic and regular IP traffic).

Claim Rejections - 35 USC § 103

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 1 above, and further in view of Kistler et al. (US 2002/0198934, hereafter Kistler)

27. For claims 10 and 11, Boucher discloses the invention as in claim 1. Boucher does not disclose a server management agent coupled to the processor that is coupled to a keyboard and/or video and/or mouse service.

However, Kistler discloses the same (fig. 3 keyboard and mouse connected to an emulator that is coupled to a NIC)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Kistler to provide console interaction handling over the network (Kistler, abstract)

28. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher as applied to claim 1 above, and further in view of Microsoft (Winsock Direct and Protocol Offload on SANs, 03/03/2001).

29. For claim 14, Boucher does not disclose the unified driver is coupled to a software TCP processor and to a socket service switch, wherein the software TCP processor is coupled to the socket service switch

However, Microsoft discloses the unified driver is coupled to a software TCP processor and to a socket service switch, wherein the software TCP processor is coupled to the socket service switch (Microsoft, fig. 1, a socket switch between a TCP/IP socket provider and a SAN provider), and wherein the socket service switch is coupled to a socket service (Microsoft, fig. 1, switch coupled to socket application).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Microsoft to provide WinSock socket service switch to a TCP/IP-offload-enabled NIC card of Boucher in order to further enhance the card with more functionalities such as RDMA traffic support.

30. For claim 12, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses a plurality of services coupled to the unified driver (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

31. For claim 13, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses the particular service comprises at least one of a socket service, a SCSI miniport service, an RDMA service and/or a keyboard and/or video and/or mouse service (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

32. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 18 above, and further in view of Official Notice (hereafter ON).

33. For claim 21, the claim is rejected as in claim 18. Boucher does not disclose employing time division multiplexing to determine which of the different types of network traffic access the software services via the single data path.

However, Official Notice is taken that it is well known in the art how to employ time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots. Microsoft Computer Dictionary (fifth edition) defines time division multiplexing as a form of multiplexing in which transmission time is broken into segments, each of which carries one segment of one signal or traffic type.

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and what is well known in the art to determine which of the different types of network traffic access the software services via the single data path by allotting multiple traffic segments of different types over one channel in different time slots using TDM in order to minimize cost and complexity of building multiple channels unnecessarily.

34. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, further in view of Yang et al. (US 2002/0041566, hereafter Yang).

35. For claim 22, the claim is rejected for the same rationale as in claim 18. Boucher does not disclose dynamically allocating fixed resources among the different types of network traffic.

However, Yang discloses dynamic and fixed resource allocation for time division multiplexing (abstract)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Yang to allocate fixed resources among traffic types to allow optimize the use of resource such as service rate while maintaining quality of services (Yang, [0018])

36. Claims 5-8 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 1 above, and further in view of Hayes et al. (US 2003/0046330, hereafter Hayes)

37. For claim 5, Boucher further discloses the processor comprises a layer 2 network interface card (L2 NIC) (fig. 13, MAC controller 402), a transmission control protocol (TCP) processor (fig. 9, TCP processor for offload).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3, [0017], NIC with an auxiliary processor for offloading iSCSI upper layer traffic)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Hayes to provide ULP support for a TCP/IP offload NIC card in order to further enhance the card with more functionalities such as iSCSI traffic support over TCP/IP.

38. For claim 6, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the TCP processor provides layer 3 processing and layer 4 processing (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic).

39. For claim 7, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the TCP processor is shared by two or more of TCP offload traffic (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic), Internet small computer system interface (iSCSI) traffic (Hayes, [0017]) and RDMA traffic.

40. For claim 8, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the ULP processor provides iSCSI processing (Hayes, [0017], [0018]).

41. For claim 24, Boucher discloses a method for network interfacing, comprising:
handling a plurality of different types of network traffic via a single Ethernet connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller supporting both offload traffic and regular IP traffic);
processing the plurality of different types of network traffic using a layer 2 (L2) processor (fig. 13, L2 MAC controller 402), a layer 3 (L3) processor and a layer 4 (L4) processor (fig. 9 a TCP/IP offload processor that processes L3 and L4 traffics) and
providing a unified data and control path (fig. 13 links between processor and PCI bus interface).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3, [0017], NIC with an auxiliary processor for offloading iSCSI traffic);

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Hayes to provide ULP support for a TCP/IP offload enabled NIC card in order to further enhance the card with more functionalities such as iSCSI traffic support over TCP/IP.

42. For claim 25, the claim is rejected for the same rationale as in claim 20.

43. For claim 26, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the L3 processor and the L4 processor are combined into a single TCP processor (fig. 9, TCP offload processor 230 bypasses (L3 IP and L4 TCP) offload traffic to upper layers (application layer...))

44. For claim 27, the claim is rejected for the same rationale as in claim 24.

45. For claim 28, the claim is rejected for the same rationale as in claim 23.

46. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-Hayes, as applied to claim 5 above, and further in view of Microsoft.

47. For claim 9, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes does not disclose the ULP processor provides RDMA processing

However, Microsoft discloses the same (Microsoft, page 5, Remote DMA semantics including RDMA write and read).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher-Hayes and Microsoft to provide WinSock socket service switch between RDMA and TCP/IP in order to further enhance the card with more functionalities such as RDMA traffic support.

48. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, further in view of Callaghan (NFS over RDMA).

49. For claim 29, Boucher discloses a unified driver embodied as a computer program on a computer system, having at least one code section for arranging and processing network traffic, the at least one code section executable by the computer system for causing the computer system to perform steps comprising:

executing said at least one code section from said unified driver to handle a plurality of different types of network traffics (fig. 6 and 10 and 13, single network interface card INIC connected to host through a PCI bridge 157, col. 14 l. 9-13, codes from INIC miniport driver on the INIC determines whether the traffic is fast path offload traffic (TCP/IP for instance) and non-fast path traffic (IP, Ethernet traffic) and network services via a single PCI bridge (fig. 13, single PCI bridge 257), the network services comprise a storage service (col. 13 lines 42-45, large file transfer service using fast path

or SMB over TCP/IP). Boucher also discloses a DMA controller for direct memory access to the host system cache (col. 13 lines 53-58).

Boucher does not explicitly disclose a socket service, RDMA service or keyboard/video/mouse service.

However, Callaghan discloses a storage service and a RDMA service (section 2 and 6, network file system service (NFS) and RDMA service using hardware, section 7)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Callaghan to implement NFS over RDMA to make full and efficient use of gigabit network (Callaghan, first par.)

50. For claim 30, Boucher-Callaghan further discloses coupling to an integrated chip to concurrently process a plurality of network traffics (Boucher, fig. 10 and 11, INIC card coupled to INIC miniport driver).

51. For claim 31, Boucher-Callaghan further discloses said plurality of network traffics comprise two or more of offload traffic (Boucher, col. 6 lines 39-55, TCP/IP processed by the processor on the network interface card (INIC) is offload traffic), storage traffic (Boucher, col. 13 lines 42-45, large file transfer service using fast path or SMB over TCP/IP), interprocess communication (IPC) traffic, management traffic and/or remote direct memory access (RDMA) traffic.

Conclusion

52. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

53. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HH

/Bunjoo Jaroenchonwanit/

Supervisory Patent Examiner, Art Unit 2152